EG&G ROCKY FLATS

INTEROFFICE CORRESPONDENCE

DATE: September 13, 1993

TO: N. M. Hutchins, ES&E, Bldg. 080, X8679

FROM: M. D. Klein, EE&T, Bldg. 080, X6950

SUBJECT: OPERABLE UNIT NO. 2, SUBSURFACE INTERIM ACTION/INTERIM REMEDIAL ACTION SOIL VAPOR EXTRACTION PILOT TESTING - MDK-028-93

A meeting was held on Wednesday, September 8th with the Environmental Protection Agency to discuss the impact of Non-Aqueous Phase Liquids (NAPLs) and their effect on the performance of the Soil Vapor Extraction (SVE) Pilot Plant. Several issues were identified with respect to the off-gas treatment system. The SVE pilot plant currently has Granular Activated Carbon (GAC) as the treatment system for extracted soil gas. The performance of the GAC adsorbers have been re-evaluated due to the presence of NAPLs. Calculations were performed to predict the soil gas concentrations based on the analytical concentrations found in the soils saturated with NAPL. Soil gas concentrations for Tetrachlorethylene (PCE) alone, in the soil pore space, have been calculated at 18000 parts per million volume (ppm/V). The SVE pilot plant, as currently configured with the GAC adsorption and at design air flow rates, would have an operational time of 4.5 hours before the GAC capacity is reached and breakthrough occurs. If the SVE pilot tests were performed as currently configured, none of the Interim Measure/Interim Remedial Action objectives would be met (DOE 1992A). Additionally, the high mass loading rate on the GAC has the potential to create a fire hazard due to an exothermic reaction.

During the meeting, EPA questioned the accuracy of the vapor concentrations that the GAC units would have to treat. Initial Soil Gas Survey (SGS) results indicated concentrations ranging from 50 to 100 ppm/V. During the drilling program, samples of the NAPL material were collected. These samples indicated the average concentration of 18,000 ppm/V. It is not known exactly what concentrations the SVE pilot plant will have to treat. Two steps will be implemented that will provide this information.

- Cap and seal the air extraction and injection wells and their associated pressure monitoring wells. Allow them to stay in a static condition for 48 hours and measure the VOC concentrations in the headspace with an instrument such as an HNhu. This will provide us an indication of what will diffuse from the soil to the vapor phase. This task is within the original scope of work.

- Modify the detailed Soil Vapor Survey such that samples are taken at the currently proposed test site (IHSS 110) from a depth of 10-15 feet. This is a modification to the scope of work that would impact cost but not schedule. This activity is currently scheduled to take place during the second week of October, with results available by the third week of October. DOE/RFO approval to perform this task is necessary.

During the meeting, EPA questioned the basis for the design of the GAC off-gas treatment system. Vapor phase concentration data was not available when the GAC system was designed. Professional judgment was used to select the GAC system. Volatile Organic Compounds were estimated at 10 ppm/V which would result in GAC consumption of 30 lbs per day for 60 days of operation. An upper bound concentration of 100 ppm/V would result in an operational time of 6 days (DOE 1992B). Information now available indicates gas concentrations that are higher than those estimated in the Pilot Test Plan (DOE 1992B).

The observational streamlined approach requested by EPA (DOE 1992A) allows for re-evaluation of both the proposed test site and off-gas treatment system when design assumptions are exceeded.

It is recommended that the Pilot Testing at the current site (IHHS 110) not be performed until additional information is available that addresses system performance and safety concerns. If you have any questions or require further information please call M. D. Klein of Environmental Engineering & Technology at X6950.

MDK:cet

cc:
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References:

(DOE, 1992A) Subsurface Interim Measures/Interim Remedial Action Plan/Environmental Assessment and Decision Document, Operable Unit No. 2.

(DOE, 1992B) Pilot Test Plan Soil Vapor Extraction Technology, Subsurface Interim Measures/ Interim Remedial Action, East Trenches Area, Operable Unit No. 2.